

Corvus corax.

Linaria montana. We are told it is common!

Passer domesticus. Already mentioned above, but an error that cannot be too often pointed out.

Emberiza citrinella. This is the last species I shall quote as an egregious blunder. We are not only told that it is found here, but that it is common too!

I have gone to greater length in reviewing this list than I at first intended. To find fault is never an agreeable task; but as it has been noticed in 'The Ibis,' and, in a few lines of introduction, the author promises us a "more extensive work" on the subject, it seems advisable, though the said work may never see the light, to say as much as I have in the interest of ornithological truth and propriety.

Malta, March 1869.

XXIII.—*Researches into the Zoological Affinities of the Bird recently described by Herr von Frauenfeld under the name of Aphanapteryx imperialis.* By ALPHONSE MILNE-EDWARDS.

(Plate VII.*)

HERR GEORG VON FRAUENFELD has lately published two figures of birds from a collection of paintings on vellum preserved in the library founded by the Emperor Francis I.†

The first of these birds is a Dodo, of which the whole body is of a uniform brownish-grey, mixed with some blue reflections. Its body is much smaller than that of the birds represented in the pictures of the two painters Savary; and the beak, compared with the head, is much less stout. These facts incline me to think that the painting has been made from a young animal.

The second figure (Pl. VII.) represents a bird altogether un-

* [We have to acknowledge the kindness of M. Alphonse Milne-Edwards in placing at our disposal impressions of this plate, which illustrates his paper on the same subject in the 'Annales des Sciences Naturelles' 5^e sér. x. pp. 325-346). It is a very faithful representation on a reduced scale of the original.—ED.]

† [*Cf. Ibis*, 1868, pp. 480-482.—ED.]



L. Beauclerk

Imo. Bequet Paris

APHANAPTERYX BRÜCKII

known to zoologists, and remarkable for its long, pointed and slightly decurved bill, the reddish colour and silky appearance (resembling that of an *Apteryx*) of its plumage, the almost entire absence of wings, and its stout feet, furnished with four toes, of which the hind toes are well developed, and rest in a great degree on the ground.

This figure is the *thirty-second* of the second volume of paintings. It is immediately preceded by that of the Dodo and one of a Cassowary, and is followed by one of a Flamingo. The only date which can be found in the collection is that of the year 1610; and the Cassowary which is represented was brought from Java by the Dutch in 1597, and given to the Emperor Rudolf II. by the Archbishop of Cologne. There is therefore every reason to believe that these birds were living at the same time in the Imperial Menagerie, which this Emperor and his father Maximilian II. kept from 1545 to 1618, in the neighbourhood of the castle of Elbersdorf, about a league to the eastward of Vienna. The Dodo, which was drawn upon vellum, was perhaps that which, according to De Bry, was brought from Mauritius to Europe by the Dutch in 1599.

Among the explorers who visited the Mascarene Islands about this time, there are some who speak of certain birds of which at the present day we have no knowledge. Thus Pieter van den Broecke*, in the account of his voyage to Mauritius in 1617, figures, by the side of the Dodo, another bird (fig. 1), with a rounded body, without wings, and with a long, pointed and decurved bill. No description agrees with this figure, which Strickland has reproduced ('The Dodo,' &c., p. 19†), only remarking of it upon the resemblance it bears to an *Apteryx*.

In 1638, François Cauche ‡ tells us that there were in Mau-

* XXVjaarige reyse-beschryving naer Africa en Oost-Indien. 8vo, Lewarden: 1617. "Beginnende Voortgangh der Vereen. Nederl. geoctr. Oost-Ind. Compagnie," vol. 2, no. xvi. p. 102, pl. 7.

† [We are much indebted to Mrs. H. E. Strickland for her liberality in lending to this Journal the wood-blocks representing in *fac-simile* this figure and that given by Herbert (to be mentioned presently), which appeared in her late lamented husband's admirable monograph.—ED.]

‡ Relations véritables et curieuses de l'Isle de Madagascar. 4to, Paris: 1651, p. 132.

ritius “des poules rouges, au bec de Bécasse ; pour les prendre il ne faut que leur présenter une pièce de drap rouge, elles suivent, et se laissent prendre à la main : elles sont de la grosseur de nos poules, excellentes à manger.”

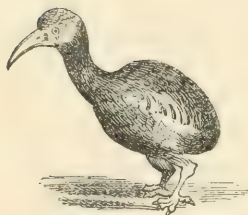


Fig. 1.



Fig. 2.

Johann Christian Hoffmann*, who lived in Mauritius, as a preacher, from the 13th of February 1673 to the 17th of March 1675, tells us that there existed then some red birds of a singular form, and the size of a common fowl, called *Todaersen*, which, though deprived of the power of flight, ran very quickly, so that to catch them “a rod is taken in the right hand, and the left is wrapt in a piece of red stuff, which is thus shown to the birds, commonly assembled in numerous flocks. Whether the red colour terrifies these stupid birds, or whether it attracts them, they approach the fowler almost without fear, and he, when they are at a convenient distance, strikes and seizes one. The cries which the captive utters attract its companions, who seek to deliver it, and thus all become the prey of the fowler”†.

It is evident that this passage refers to the *Poules rouges* of Cauche. Hoffmann designates them wrongly under the name of *Todaersen*, which has been often applied to the Dodo ; but it is probable that, in 1673, this had already disappeared from Mauritius, where it had become so rare that the author just mentioned had never seen one.

It is impossible not to recognize the similarity between the

* Oost-Indianische Voyage, u. s. w. 8vo, Cassel : 1680, p. 52. [Cf. Ibis, 1868, pp. 479, 480.—Ed.]

† ‘Leopoldina,’ 1868, p. 52.

flightless "red fowls" of which Cauche and Hoffmann speak, and the bird which has been found figured in the collection of paintings on vellum in the private library of the Emperor of Austria. These paintings are, for the most part, the work of the same artist; some have evidently been executed from living subjects, others from stuffed animals; and some, indeed, are the result of the painter's imagination. It is thought they are from the pencil of the celebrated Dutch miniature-painter George Hoefnagel, who was born at Amsterdam in 1545 or 1546, and died between 1608 and 1617, and was attached to the court of Rudolf II. as "peintre du cabinet." The attitude of the bird in question is so natural, that it is allowable to suppose that it has been drawn from the life, in addition to which, the feathers which correspond to the base of the wing seem to be somewhat in disorder. This bird presents the essential characters assigned by Cauche to his *Poules rouges*. It has the same coloration, the same form of the bill, and we also find in it the structure of the feathers indicated by Hoffmann. Herr von Frauenfeld does not hesitate to establish this relation, and gives his work the title of a "Newly-found figure of the Dodo, and of a second short-winged Bird, the *Poule rouge au bec de Bécasse*." This bird is so remarkable, and offers characters so special, that it is easy to distinguish it by means even of a very succinct description. The painting which now exists, and has been very skilfully reproduced in chromolithography, at the cost of the Zoologico-botanical Society of Vienna, makes known to us most of the external characters of this new Mauritian bird. The bill is black, very pointed, and regularly decurved; it is very nearly twice as long as the cranium. The upper mandible is rounded above; and near the base is seen the opening of the nostril, which is small and very narrow. The eye, of which the iris is yellowish, is situated far forwards; behind and lower down, the mark of the auditory foramen is perceptible. The plumage, of a uniform reddish hue, has no consistency; the feathers, like those of the *Apteryx*, have a simple shaft, and the barbs and barbules are long, soft, and do not adhere to each other; those of the hind part of the flanks are the most developed. The neck is pretty long, and clothed on the nape with overhanging

feathers, so as to form a sort of cervical crest. No indication of wings is to be seen. The tail is rudimentary, and formed of short, soft, and drooping feathers. The feet are somewhat long, and very strong. The feathers of the legs stop short at some distance from the heel, so that the lower extremity of the tibia is bare. The foot is covered with broad scutellations; the toes, four in number, are cylindrical, and have no interdigital membranes, even at their base. The hallux, as I have already said, is well developed, and rests in a great degree on the ground.

The zoological position which this bird should occupy was very difficult to determine; and Herr von Frauenfeld, after having compared it with the *Brevipennes*, the *Gallinaceæ*, and the *Rallidæ*, arrives at the conclusion that it unites the plumage and the imperfect wing of the *Apteryx*, the carriage and the bill of the Rails, with the feet of the *Gallinaceæ*.

It is plain that, from an inspection alone of a coloured drawing, the systematic position of the *Poule rouge au bec de Bécasse* could not be determined with greater precision; and this question would have been the object of discussions similar to those which have taken place of late years with regard to the Dodo, were it not that particular circumstances allow me to complete now the history of this unexpected discovery, and to determine the place which the *Poule rouge* should hold in the ornithological scale. Among the remains collected with those of the Dodo from the Mare aux Songes, in Mauritius, and submitted to my examination by Mr. Edward Newton, are some bones of the foot, which appeared to me most interesting, seeing that they showed the existence of a new form allied to *Ocydromus*, but more of a runner than that bird.

I had also remarked a long and curved lower mandible, which seemed to come from a bird having certain resemblances to the *Rallidæ*, or from an entirely unknown Wader; but I hesitated much about referring it to the same bird as the leg-bones. I was employed in describing them when Count Marschall informed me of the discovery which had just been made in the Emperor's private library; and, with his kindness, so well known by all men of science, he sent me first an extract from Herr von Frauenfeld's work, and then the publication itself. I im-

mediately recognized the remains of which I have just been speaking, as belonging to the species represented along with the Dodo, and I felt certain that this very singular bill, and the leg-bones, came from the same bird.

The lower mandible (figs. 3 & 4) found in Mauritius is nearly

Fig. 3.



Fig. 4.



perfect, wanting only one of the articular extremities. Throughout the portion corresponding to the dentary bone, it is gently decurved in a regular manner, so that its lower edge follows almost exactly the arc of a circle, having a radius of 0^m.11. In

the Curlews and Ibises the curvature is less regular, and betrays itself especially in the terminal portion. In *Apteryx* the mandible is much straighter. The two branches, but little separated from each other at the articular portion, unite at a great distance from their extremity and coalesce intimately, so as to give the whole terminal portion of the bill great firmness. The lower surface exhibits no trace of the original separation of the dentary bones. It is rounded, and presents no such groove as that which occupies the median line in the Ibises, and of which traces are still perceptible in *Apteryx*. The bony tissue in this portion is extremely close and strong; it is only pierced by a few orifices, and presents nothing to be compared to the sponginess (so to speak) of the tip of the bill in the Godwits, the Woodcocks, the Curlews, *Apteryx*, and others—a structure which relates to the number of nerves and vessels meeting in this part, and to which these birds owe the exquisite sense of touch, enabling them to seek the worms which are hidden in the earth and mud. This fossil bill was evidently not adapted for such a diet, for it terminates in a sharp and strong point. Behind the posterior branches of the dentary there is a narrow but somewhat long fissure, indicating the original separation of the dentary from the angular and the surangular. The position of this fissure, placed obliquely from above downwards and from before backwards, furnishes us with some rather important characters; in fact, this fissure, which I have called the “post-dentary orifice or fissure,” is wanting in certain families, such as the diurnal birds of prey. In the *Passeres*, properly so called, it exists, but presents a peculiar form, very distinct from that which I have just mentioned; it resembles, indeed, an ovate fenestra, while in our fossil it is a real cleft left between the different bones above named. The *Passeres* which have the bill much curved, such as *Promerops*, *Xiphorhynchus*, *Falculia*, *Dendrocolaptes*, *Fregilus* and so forth, present in this respect exactly the same characters as those with a straight bill. In the *Gallinaceæ* very considerable variation may herein be noticed: thus, while in *Pavo* the postdentary orifice is almost entirely effaced, it is enormous in the Grouse, and especially in *Tetrao urogallus*, where it is placed forwards at a very great

distance from the articular surface. In the *Scolopacidae* and *Charadriidae*, the postdentary cleft has a greater resemblance to that of our fossil, but it is placed less obliquely; and to find a more perfect likeness this last must be compared with the bill of certain of the *Rallidae*, and more especially with *Ocydromus*. The masseterian portion of these birds is narrower; and this also has reference to the greater shortness of the bill, which requires less powerful muscles for its movements, and consequently less extended insertional surfaces. The upper edge of this surface corresponding to the surangular, whereto the fibres of the temporal muscle are attached, is much elevated; however, it does not appear to possess at this point ossified tendons such as those of *Porphyrio*. Behind the masseterian surface, and in front of the articulation, there is a rounded and open vascular foramen.

The articular surface is broad, but not much elevated. It consists, as usual, of two facets, of which the outer one, intended to be applied to the jugal extremity of the quadrate, is placed obliquely from without inwards. It is comparatively much more developed than in the Curlews, the Ibises, and most other Waders, and in this respect resembles that of *Porphyrio* and *Ocydromus*. The inner facet, which articulates with the pterygoidian portion of the quadrate, is subquadrilateral, and very much enlarged from before backwards. In the *Scolopacidae* and *Charadriidae* it is narrow, and turned towards the inner articular apophysis. The shape of these facets is somewhat worthy of consideration; for it gives an idea of that of the quadrate, the importance of which will not be disputed.

The postarticular apophysis is strong, moderately projecting, and turned outwards. It is continued downwards with a very thin ridge, which there has reference to another lower articular apophysis. Lastly, there is an inner articular apophysis, strong, but placed a little in advance, a situation the like of which is not to be seen in any other bird. In the great group of *Passeres*, there is a postarticular apophysis, but it is short, and resembles a tubercle; the inner apophysis, on the contrary, is very long, but there is no lower bony prolongation corresponding to the angle of the jaw, so that the articular extremity is extremely flattened. As much may be said of the *Gallinaceae*, wherein it

may be seen in the development of the inner and lower articular apophyses, these last, in *Tetrao urogallus*, rising to a great height behind the cranium.

In the genus *Ibis*, there is no lower bony projection, besides which, the hinder surface is deeply depressed, so as to give it a very peculiar appearance. The Curlews are equally destitute of a lower articular apophysis.

The whole arrangement of the apophysis in our fossil much recalls that which is proper to the *Rallidæ*, and, in that family, attains its maximum of development in *Ocydromus*, of which it may be said with certainty that, of all the representatives of the class of birds, it most approaches that of the very remarkable bill found in Mauritius, where we find again a strong and short inner apophysis, prolonged into a ridge as far as the lower bony projection. This is clearly marked, though a little more weakly than in our fossil.

In the Coots, the articulation is arranged very nearly in the same manner. Among the Gallinules (*Tribonyx* and *Porphyrio*) the lower apophysis projects less. In this respect *Apteryx* differs much from our fossil; for in the first the post-articular apophysis is rudimentary and the lower angle is rounded.

If, according to the structure of the bill, we endeavour to give an account of the habits and the food of the bird to which it belongs, we shall see that the absence, or at least the little development of the foramina, and of the channels giving passage to the nerves and vessels, will not allow us to attribute to it the manners of the Ibises, Curlews, Godwits, or Woodcocks. This pointed bill has a very close tissue, and somewhat resembles that of *Porphyrio* and *Ocydromus*, recalling still more the form of the mandibles in the Oyster-catchers, and apparently adapted for crushing mollusks and their shells, animals on which this bird probably fed.

A glance at the bone of the foot (figs. 5, 6) is sufficient to convince one that it belonged to a bird admirably adapted for walking. It is perfectly balanced; without being too massive, it is very stout; the diaphysis is nearly as thick as broad, its angles are rounded, and the anterior metatarsal furrow is but slightly

marked in its upper portion, while it is completely effaced below; none of the projecting lines which bound the insertional surfaces of the extensor muscle of the hallux, of the abductor of the inner toe, and of the adductor of the outer toe, are to be seen. The tibial impressions are unequal, the inner one being more elevated and much stronger than the outer; they are surmounted by a slightly deep impression, at the bottom of which open the superior orifices, the outer one being placed much higher than the inner. Within there is seen, bounded by two little ridges, a furrow, which lodges the tendons of the common exterior muscles of the toes. The posterior surface of the bone of the foot is rounded, and traversed longitudinally by clearly defined intermuscular lines. The surface of the attachment of the flexor muscle of the hallux is but little marked.

The upper articular extremity is somewhat narrow; and the glenoid facets are placed at different levels, that of the inside being higher than that of the opposite. They are separated by a strong intercondylar tuberosity, at the base of which a somewhat deep depression (whereto the semilunar ligament is attached) is seen on the outside. The heel is partly broken; however, it may be seen that it was but slightly projecting, and that it was only grooved inside by very superficial furrows. The digital trochleæ are strong and placed at different levels. The median is the longest, and is broad, much arched, and followed by a deep groove; a very open slope separates it from the outer trochlea, which is much shorter and very broad. The inner trochlea is the smallest, and terminates on a level with the base of the middle one; it is much thrown back. The depth of

Fig. 5.

Fig. 6.



the depressions hollowed out on the lateral surfaces of the trochlea shows that the toes must have been very firmly attached to the bone of the foot. The articular facet of the hind toe is large and depressed, so that the lower orifice, through which passes the tendon of the adductor muscle of the outer toe, is large; but it is only continued on the body of the bone by a furrow, which is scarcely visible.

The characters I have just described show in the clearest manner that the bone in question cannot come from a bird of prey, nor from one of the *Passeres*, nor from a web-footed bird. It must have belonged to a walking bird; and, from its general form, as well as from many of its characters, it resembles that of the *Gallinaceæ*. Still it is impossible to refer it to this last group. In fact, among all the *Gallinaceæ*, without exception, the flexor muscle of the hallux is attached to a deeply hollowed surface on the inner posterior side of the heel, and is bounded by very prominent ridges. This character, as I have already said, is wanting in the tarso-metatarsus recovered from the Mare aux Songes. The digital trochleæ of the *Gallinaceæ* are always much shorter, and that of the inner toe is prolonged a little lower than in this last. Lastly I will add that in nearly all the birds of this group, even in many that are deprived of spurs, there is always a ridge or a bony stay uniting the inner posterior ridge of the bone to the heel.

If we compare the fossil metatarsus with that of the Waders, we see that its relative proportions, as well as its anatomical peculiarities, remove it from that of the *Ciconiidae*, *Gruidæ*, *Ardeidæ*, *Scolopacidæ* and *Charadriidæ*, and Bustards. But we find in it great analogies with that of certain members of the family *Rallidæ*, although it differs much from the normal form of that group. In these birds, indeed, the digital trochleæ are very close to each other, and the lower extremity is consequently narrow, whereas in our fossil the contrary arrangement is observable. The foot of *Porphyrio* is distinguished, not only by this character, but also by the depth of the anterior metatarsal furrow, and by that of the insertional surface of the flexor muscle of the hallux. This peculiarity is not to be found in the Rails, the Water-hens, the Jacanas, or *Tribonyx*; but the bone of the tarso-metatarsus

is always to be recognized by the little interval which separates the trochlea of the middle from that of the inner toe. It may be remarked, however, that this interval increases as the birds are better adapted for walking and running. Thus the interdigital slope is broader in the Rails than in the Coots; it disappears more in the genus *Tribonyx*, and especially in *Ocydromus*. Following step by step its modifications, we pass insensibly from the normal form, which is presented to us in the tarso-metatarsus of the Rails, to a form which at first sight would appear to be altogether different, and is, so to speak, much more of a walker. The fossil we are examining furnishes us, in some respects, with an exaggeration of it; for it is evidently better adapted for terrestrial locomotion than that of *Ocydromus*, and even offers some resemblance to that of *Apteryx*. In *Ocydromus* the anterior metatarsal furrow is deeper than in our fossil; the tendon of the common extensor of the toes passes under a bony bridge; the heel is hollowed inside by two pretty deep tendinal grooves: but the general plan is the same; and it may be conceived that if the modifications which we have just followed act always in the same sense, they lead to the form which we find in the bone found in Mauritius. There is, still, an enormous difference between the fossil and the tarso-metatarsus of *Apteryx*; but it can, however, be considered to be a transition between this last and the normal *Rallidæ*; for what are the anatomical modifications which this bone presents in *Apteryx*? The shaft of the bone is seen to be much shortened and widened; the intermuscular lines are effaced; the digital trochleæ, hardly disposed according to the same plan, and separated by very broad slopes, are stout and rounded. The heel is but slightly prominent, and shows no tubular canal; it is hollowed by two wide furrows, between which is a somewhat projecting ridge. These peculiarities are of the kind which are offered by our fossil compared with the tarso-metatarsus of *Ocydromus*, or this last compared with its homologue in the Rails or the Water-hens. The examination of the osteological characters leads us to think that the bird from which the fossil in question came presented undeniable analogies with the Rails.

In the same deposit with this lower mandible and this tarso-

metatarsus, several tibiæ have been found which seem as if they ought to be referred to the same bird; for a study of the peculiarities they offer leads to the same result as the examination which I have just been making of the osteological characters of the bone of the foot.

The fossil tibiæ (figs. 7, 8) are remarkable for the want of

Figs. 7, 8.



thickness of the diaphysis compared with the articular extremities; the shaft of the bone is in fact nearly cylindrical, more slender below the peronean ridge than at its lower extremity, and it presents a slight concave curvature inside. The peronean ridge is somewhat strong, and is prolonged to the upper third of the bone. The fibula would seem to have terminated a little below the lower third, as is indicated by the rugosities which exist at this point.

The upper extremity is large and rounded, the anterior tibial ridge advances a good deal and curves outwards; but it is very little elevated above the articular surface. The rotular ridge is but little marked, and the outer tibial ridge is prolonged outwardly in curving round in front of the peronean.

The lower extremity is massive; the two condyles are very unequal, that of the inner side is narrow and advanced, that of

the outer is broad and rounded, the groove which separates

them is of somewhat great breadth; there are no pits below for lodging the posterior edge of the glenoid facets of the metatarsus, in the way that is seen in many of the Waders. The furrow of the anterior tibial muscle passes under a well-developed bony point; the groove of the short peronean muscle is hardly indicated.

Among the Rails, *Ocydromus* alone offers like peculiarities in the structure of the leg-bone; and there they differ remarkably from the other genera of the same family; for in them the tibia is relatively much more elongated, the articular extremities are more in proportion to the size of the diaphysis and the tibial ridges, and much higher and more prominent. In this respect there are many more differences between the structure of the normal *Rallidæ* and of *Ocydromus* than exist between this last and our fossil. Indeed it is to be remarked that the tibia of *Ocydromus* is comparatively very thick and short, and that its extremities, particularly the upper one, are more swollen than is usual, without, however, being nearly so much so as in our fossil. The osteological peculiarities of the lower extremity are the same, but the diaphysis in *Ocydromus* is less bowed. The tibia of *Apteryx* differs much from that of the Mauritian bird: the direction of the tarsal articulation is quite otherwise; the relative size of the condyle is not the same; the furrow of the anterior tibial muscle does not pass under a bony bridge, and remains uncovered; the anterior tibial ridge is much less prominent, and so forth. There is, however, in the general aspect and the relative proportions of the bone, something which recalls those of the fossil, indicating that, though belonging to a bird of a distinct zoological group, it presents some traces of resemblance to this singular genus of the Brevipennate group.

The proportion in the length of the bone of the foot and of the leg is not the same as in *Ocydromus* or *Apteryx*—the tarso-metatarsus being notably longer, and being equal to two-thirds the length of the tibia. Thus, if the dimensions of the last bone are represented by 100, the length of the tarso-metatarsus would be 67, while in *Ocydromus* it would be only 57·5, and in *Apteryx* 54.

Elsewhere in the family *Rallidæ* these proportions vary

within very wide limits, not that one can attach a very great importance to these differences. This may be proved by a glance at the following numbers, which show the proportion of the tarso-metatarsus to the tibia—the length of the latter being taken at 100 :—

<i>Fossil Metatarsus</i>	67	<i>Porphyrio madagascariensis</i>	68
<i>Ocydromus australis</i> . .	57·5	<i>Rallus crex</i>	64
<i>Tribonyx mortieri</i> . . .	64	— <i>aquaticus</i>	64
<i>Aramides cayennensis</i> . .	72	<i>Gallinula chloropus</i>	62*
<i>Metopidius africanus</i> . .	71	<i>Fulica atra</i>	57

Thus in our fossil bird the proportion of the leg to the foot was nearly the same as in *Porphyrio*, *Tribonyx*, and the Rails.

To sum up, we see then that the remains the characters of which I have just been examining belong evidently to the bird which Herr von Frauenfeld has recently figured, and that they are sufficient to indicate clearly the systematic position of this remarkable animal. It evidently was one of the family *Rallidæ*, and there is much less difference between it and *Ocydromus* than between this last and the (true) Rails. It constitutes in this group one of the transitional forms so remarkable in the animal kingdom, and should be regarded as a Ralline the organization of which was adapted to an essentially terrestrial existence. The feathers of the wings are too slight and offer far too little resistance to have been of use in flight; and, besides this, the wings themselves are rudimentary. The feet, on the contrary, show considerable strength; but they are only slightly elevated, and the toes are less elongated than is usual in this family. This last fact gives us reason to think that this species had less aquatic habits than most of the *Rallidæ*. The hind toe, however, is very long, as in birds which haunt muddy places or a soil of little consistency—although in the true Runners it disappears more or less completely, so as to diminish the weight of the arm of the lever formed by the foot. It may be seen by the nature of the feathers that the *Poule rouge* was still more brevipennate than *Notornis*; and it is also probable that the

* [In M. Milne-Edwards's paper (Ann. Sc. Nat. *ut supra*) the proportional length in this species is given as "72."—ED.]

sternum was still less carinate than in that bird*, and that the furcula either did not exist, or was reduced to a styliiform state. We may hope that new researches to be made by Mr. Edward Newton in Mauritius will bring to our knowledge some of these interesting portions.

Herr von Frauenfeld has proposed to regard the bird of which we are treating as the type of a new generic division, and gives it the name of *Aphanapteryx imperialis*. Whether this name may be retained, and whether other authors have not spoken of this vanished ornithological form, are questions which we have now to examine. Several naturalists had already tried to interpret zoologically the imperfect descriptions and figures left by travellers who visited the Mascarene Islands towards the end of the sixteenth and in the seventeenth centuries; and each of the birds of which they have been able to suspect the existence had already received at least one peculiar name, even when its zoological relations were altogether unknown. Thus Mons. de Selys-Longchamps has united all these doubtful species in one and the same generic division, to which he has applied the name of *Apterornis*†.

The bird figured by Van den Broecke (fig. 1) is evidently that which Cauche called the *Poule rouge au bec de Bécasse*, and it seems to me that we may identify them with almost absolute certainty with the *Aphanapteryx imperialis*. But ought one on that account to replace this generic name by that of *Apterornis*? I think not; for the celebrated Belgian naturalist has formed this last genus out of very heterogeneous elements, and the characters which he assigns to it are besides vague, and could be applied (as actually is the case) to birds belonging to very different groups.

"The genus *Apterornis*," says this author, "differs remarkably from the two preceding [*Didus* and *Pezophaps*] by its long bill, somewhat resembling that of the Woodcocks, but larger. This bill in appearance recalls that of *Apteryx*. These birds were mounted on long legs, ran fast, and differed more from

* Prof. Owen has given a figure of this in his 'Anatomy of Vertebrates' (vol. ii. p. 21).

† [Revue Zoologique, 1848, p. 293.—TRANSL.].

the Pigeons than the Dodo and *Pezophaps*, which they otherwise resembled in their wings, unfit for flight, in the want of a tail, or having only a rudimentary one, and in the number and disposition of their toes."

As type of the genus M. de Selys-Longchamps gives *Apterornis solitaria*—that is to say, the Solitaire of Réunion, of which we have no remains. Indeed we only know it by the accounts of some travellers, and especially of Carré and Dubois*. This bird, whose plumage was white or tinged with yellow, may be perhaps the white Dodo, represented in a picture exhibited to the Zoological Society of London, and reproduced in a memoir on the subject published in its 'Transactions' [Vol. vi. pp. 373-376, pl. 62].

The second species of *Apterornis* of M. de Selys, which he calls *A. cærulescens*, is nothing else than the *Oiseau bleu* of which Dubois gives us some particulars which I here quote :—" *Oyseaux bleus*, as large as the Solitaires, have their plumage all blue, their bill and feet red, and in form like those of fowls. They do not fly, but they run so quickly that a dog can hardly catch them in a course. They are very good."

The blue colour of the plumage, the hue of the feet and the bill, and the rapidity with which they run would seem to indicate well a bird belonging to the group *Porphyrio*. Strickland had fully seized this idea when he said, "I should have been disposed to refer the '*Oiseau bleu*' to the genus *Porphyrio*, were we not told that they were the size of the Solitaire, i. e., of a large Goose, that the feet resembled those of a hen, and that they never fly." ['The Dodo', &c. p. 59.]

* [In a note appended to a translation of Prof. Schlegel's paper "On some Extinct Gigantic Birds of the Mascarene Islands" (Ibis, 1866, pp. 146-168), which was contained in the 'Annales des Sciences Naturelles—Zoologie' for 1866 (5th ser. tom. vi. pp. 25-49), M. A. Milne-Edwards mentioned that the MS. journal of the "Sieur D. B.", in the possession of the Zoological Society, had been published at Paris in 1674, and that the author's name was Du Bois. We have lately learnt that this fact was pointed out seventeen years ago by Mr. Pinkerton in 'Notes and Queries' (1st ser. vol. vi. p. 83, July 25, 1852); and this gentleman has been kind enough to inform us that there is a copy of the work in the British Museum ("King's Library, no. 279, b, 31").—ED.]

When Strickland wrote these lines, nothing was known of the *Notornis* (discovered in 1850), in which nearly all these characters are found. But when, later, Prof. Schlegel* sought to determine zoologically the former birds of the Mascarene Islands, he ranked this species in the genus *Notornis*. It seems to me that the *Oiseau bleu* cannot belong to any other group than *Porphyrio*; but, on the other hand, it seems to me very difficult to establish genera and species solely on the narratives of travellers, who for the most part attaching only a very secondary importance to questions of natural history, could not have observed very attentively the characters of species, and have given an account of them in an approximate manner. Thus all the discussions which have been raised with respect to the zoological place of the *Oiseau bleu* have been based on the description of Dubois; but was this accurate? We may doubt about it, because in a letter written by Brown, a Jesuit Missionary, and published in 1724, in the 'Lettres Édifiantes'†, we find the following passage:—

“Vers l'est de cette Isle, il y a une petite plaine au haut d'une montagne, qu'on appelle la plaine des *Coffres*, où l'on trouve un gros oiseau bleu dont la couleur est fort éclatante. Il ressemble à un pigeon ramier; il vole rarement, toujours en rasant la terre, mais il marche avec une vitesse surprenante; les habitans ne lui ont point encore donné d'autre nom que celui d'oiseau bleu; sa chair est assez bonne et se conserve longtemps”‡.

According to this author, not only was the *Oiseau bleu* only of the size of a Wood-Pigeon, but it was able to fly. It is difficult, not to say impossible, in this case to say on which side the truth lies, and in which of the accounts the most confidence should be placed. I have given this example to show what sort

* [Versl. en Mededeel. K. Ak. Wetensch. Natuurk., vii. p. 116 *et seq.* Translated, Ibis, 1866, pp. 146-163.—Ed.].

† Lettres édifiantes et curieuses, écrites des Missions étrangères. Nouvelle édition. Paris: 1781. Mémoires des Indes, tom. xiii. p. 313.

‡ [Cf. 'The History of Mauritius,' &c., by Charles Grant. London: 1801, p. 167; the passage quoted by Strickland 'The Dodo,' &c., p. 60.—Ed.].

of reserve ought to be maintained when it is a question of making use, for the study of species, of the curt descriptions given by travellers in the sixteenth and seventeenth centuries. But whether the *Oiseau bleu* was a *Porphyrio* * or a *Notornis* matters little to the question of which we are treating here. It is any how plain that it belongs to quite another genus from the Solitaire [of Réunion]; and if one regards this last as the type of the genus, it should be distinguished from the *Apterornis carulescens*.

The *Apterornis bonasia*, which forms the third representative of the *Apterornis* of M. de Selys-Longchamps, is still more difficult to determine exactly; for several species are found to be united under this one name. Thus this specific type would include:—

First, the “Hen” of which Sir Thomas Herbert has left a very imperfect figure (fig. 2), wherein the bill is long, straight, and pointed, instead of being curved like that of *Aphanapteryx*. There is no vestige of a tail, but it seems to have had extremely short wings. This is the bird to which Prof. Schlegel has assigned the name of *Didus herberti*.

Secondly, The *Poule rouge au bec de Bécasse* of Cauche.

Thirdly, The *Gelinottes*, which inhabited Rodriguez at the time when Leguat lived there. These are distinguished clearly from the preceding by their light grey colour, and by the form of their bill, which was straight, pointed, and red.

Lastly, M. de Selys-Longchamps finishes the passage relating to his *Apterornis bonasia* by quoting the figure given in Van den Broecke’s voyage (fig. 1).

Accordingly *Apterornis bonasia* includes at least three distinct species, among which is to be found the *Aphanapteryx* of Herr von Frauenfeld; but for this bird that specific name cannot be adopted, because it ought to be applied to the first species of which M. de Selys-Longchamps speaks—that is to say, to that of which Herbert has left a coarse figure (fig. 2), and of which the chief characteristic is a straight and pointed bill.

* [It has already been suggested (Maillard, Notes sur l’île de la Réunion, Paris, 1862, p. 159. and P. Z. S. 1865, p. 836), that this “Oiseau bleu” was *P. madagascariensis*.—Ed.]

Consequently, if the Solitaire of Bourbon (Réunion), and the *Didus herberti* of Schlegel be left in the genus *Apterornis*, the *Oiseau bleu* as well as the *Poule rouge au bec de Bécasse* of Cauche should be separated from it, and the generic name of *Aphanapteryx*, proposed by Herr von Frauenfeld, ought to be kept for the last species. But, on the other hand, it is plain that *Aphanapteryx imperialis* (Plate VII.) is nothing else than the bird figured in Van den Broecke's voyage (fig. 1), to which Prof. Schlegel has given the name *Didus broeckii*; and this cannot give rise to any contradiction, since the learned Director of the Museum at Leyden has distinguished this species from those which had a straight instead of a curved bill. The specific designation proposed by Prof. Schlegel ought then, according to the law of priority, to take the place of that which has been more recently given, and *Aphanapteryx imperialis* should bear the name of APHANAPTERYX BROECKII.

This bird, by the side of *Ocydromus*, holds the place which that occupies by the side of the Rails; and these relations are of the same nature as those which exist between *Porphyrio* and *Notornis*; and it belongs undoubtedly to the family *Rallidae*—conclusions which the study of its external characters would not have allowed to be established.

EXPLANATION OF THE WOODCUTS.

Fig. 1, p. 258, a copy in *fac-simile* of Van den Broecke's figure.

2, " " " " Herbert's figure.

3, p. 261, lower mandible from Mauritius, upper view.

4, " " " " side view.

5, p. 265, tarso-metatarsus from Mauritius, front view.

6, " " " " outer view.

7, p. 268, tibia from Mauritius, front view.

8, " " " " inner view.

XXIV.—On the Kingfishers of South Africa.

By R. B. SHARPE.

THE present paper is written chiefly with the view of correcting a few errors which have found a place in Mr. Layard's 'Birds of South Africa.' The different criticisms upon, and reviews of, this work which have appeared have not touched particularly on